

# Kyoto & Carbon (K&C) Initiative

Forest Theme

Current Status of Projects

# Overview

- **Product name:**
  - Forest change detection maps of two Prototype areas in Sweden using PALSAR data
- **Description:**
  - Forest change detection maps of clear-cuts in southern (the county of Västra Götaland) and northern (the county of Västerbotten) Sweden using PALSAR data
- **PALSAR mode:**
  - FBS 34.3° (HH) and FBD 34.3° (HH+HV)
- **Observation cycles:**
  - 9, 13, 14, 17, 21 and 22
- **Production schedule (estimated):**
  - Development of processing chain (2007)
  - Methodology development (2007)
  - Adaptation of processing chain to regional scale mapping (June, 2008)
  - Up-scaling and testing of methodology for change detection (June, 2008)
  - Production of deforestation maps (December, 2008)
- **Estimated date of delivery:**
  - January 2009

# Project Aims

- To evaluate the possibilities to detect and map clear-cuts for two Prototype areas in Sweden using PALSAR data

## Study Area

- **Local study areas:**
  - Remningstorp (located in the county of Västra Götaland)
  - Brattåker (located in the county of Västerbotten)
- **Prototype areas:**
  - The counties of Västra Götaland and Västerbotten
- **Product areas:**
  - Sweden

# SAR Data Acquisitions

- **ALOS PALSAR**
  - 533 scenes (Västra Götaland and Västerbotten)
    - Single
    - Dual
- **(JERS-1 SAR)**

# Map of Sweden



Map showing the locations of the two local study areas (Remningstorp and Brattåker) and the two Prototype areas (the counties of Västra Götaland and Västerbotten) in Sweden.

# Preliminary Results



Old spruce forest stand.

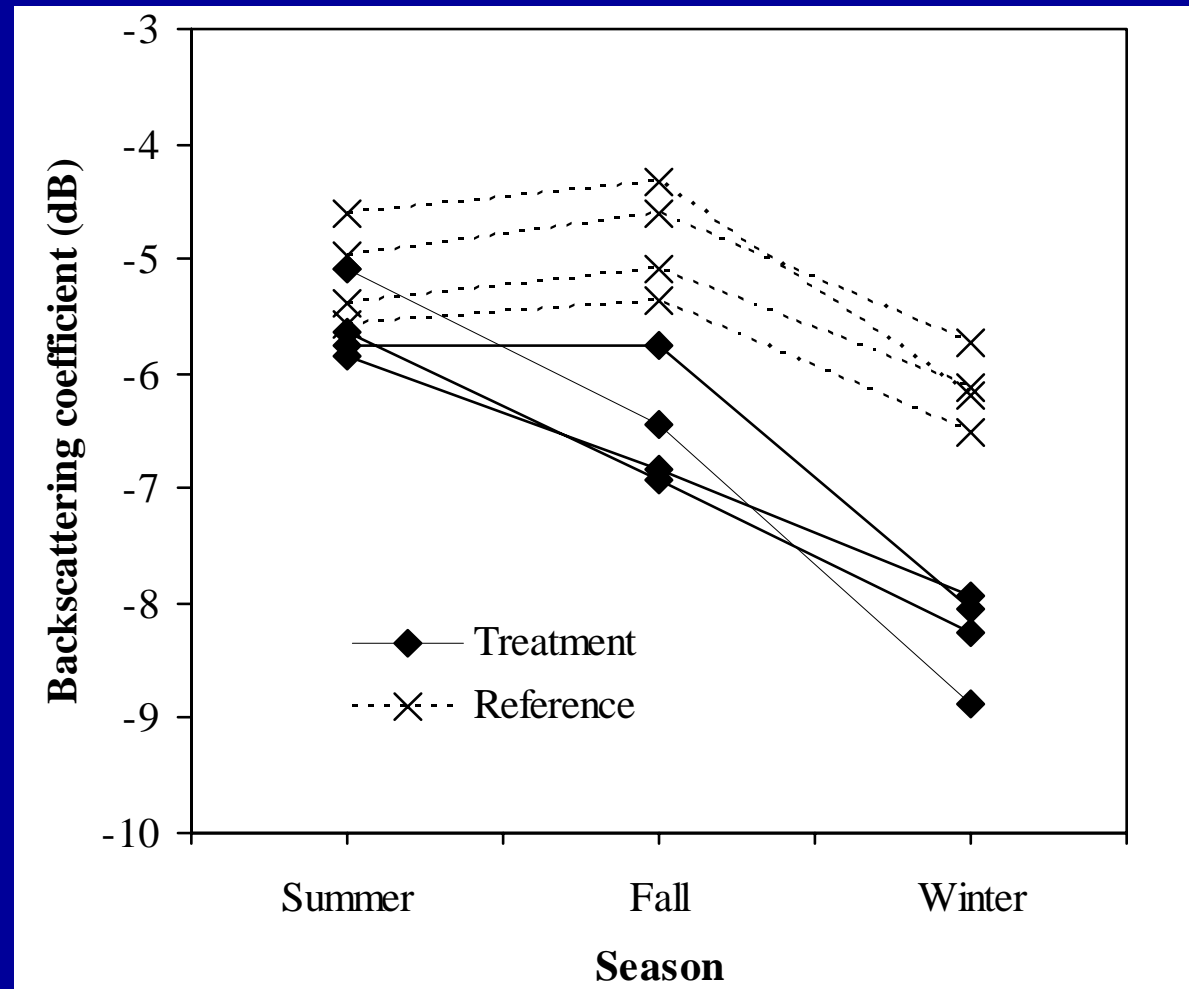


Artificially wind-thrown forest stand.



Clear-felled forest stand.

# Preliminary Results



Backscattering coefficient from PALSAR FSB images (look angle  $34.3^\circ$ , HH-polarization) for 4 reference and 4 treated stands at three different occasions. Summer: reference (old forest) vs. old forest, Fall: reference vs. artificially wind-thrown forest, and Winter: reference vs. clear-felled forest.

# Processing

- Sequences
  - Processing Level: SLP
  - Processing software: Gamma
- Issues



# Future work

- Production of deforestation maps covering the counties of Västra Götaland and Västerbotten in Sweden using PALSAR data
- Production of deforestation maps covering Sweden using PALSAR data (beyond January 2009)

## Publications relating to ALOS (K&C)

- Fransson, J.E.S., Magnusson, M., Olsson, H., Eriksson, L.E.B., Sandberg, G., Smith-Jonforsen, G., and Ulander, L.M.H. 2007. Detection of forest changes using ALOS PALSAR satellite images. In Proceedings of IGARSS 2007 Symposium, Sensing and Understanding Our Planet, Barcelona, Spain, 23-27 July, 2007.
- Magnusson, M., Fransson, J.E.S., Eriksson, L.E.B., Sandberg, G., Smith-Jonforsen, G., and Ulander, L.M.H. 2007. Estimation of forest stem volume using ALOS PALSAR satellite images. In Proceedings of IGARSS 2007 Symposium, Sensing and Understanding Our Planet, Barcelona, Spain, 23-27 July, 2007.

## Publications relating to ALOS (Cal & Val)

- Ulander, L.M.H., Eriksson, L., Smith-Jonforsen, G., Fransson, J.E.S., and Olsson, H. 2006. ALOS calibration and validation activities in Sweden. In Proceedings of IGARSS 2006 Symposium, Remote Sensing: A Natural Global Partnership, Denver, Colorado, USA, 31 July-4 August, 2006, pp. 336-339.
- Eriksson, L.E.B., Sandberg, G., Ulander, L.M.H., Smith-Jonforsen, G., Hallberg, B., Folkesson, K., Fransson, J.E.S., Magnusson, M., Olsson, H., Gustavsson, A., and Flood, B. 2007. ALOS PALSAR calibration and validation results from Sweden. In Proceedings of IGARSS 2007 Symposium, Sensing and Understanding Our Planet, Barcelona, Spain, 23-27 July, 2007.